

Environmental Protection Agency

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(2) Calcining sodium sesquicarbonate.
(3) Using a liquid alkaline feedstock process that directly produces CO₂.

(b) In the context of the soda ash manufacturing sector, “calcining” means the thermal/chemical conversion of the bicarbonate fraction of the feedstock to sodium carbonate.

§ 98.291 Reporting threshold.

You must report GHG emissions under this subpart if your facility contains a soda ash manufacturing process and the facility meets the requirements of either § 98.2(a)(1) or (a)(2).

§ 98.292 GHGs to report.

You must report:

(a) CO₂ process emissions from each soda ash manufacturing line combined.

(b) CO₂ combustion emissions from each soda ash manufacturing line.

(c) CH₄ and N₂O combustion emissions from each soda ash manufacturing line. You must calculate and report these emissions under subpart C of this part (General Stationary Fuel Combustion Sources) by following the requirements of subpart C.

(d) CO₂, CH₄, and N₂O emissions from each stationary combustion unit other than soda ash manufacturing lines. You must calculate and report these emissions under subpart C of this part (General Stationary Fuel Combustion Sources) by following the requirements of subpart C.

§ 98.293 Calculating GHG emissions.

You must calculate and report the annual process CO₂ emissions from

each soda ash manufacturing line using the procedures specified in paragraph (a) or (b) of this section.

(a) For each soda ash manufacturing line that meets the conditions specified in § 98.33(b)(4)(ii) or (b)(4)(iii), you must calculate and report under this subpart the combined process and combustion CO₂ emissions by operating and maintaining a CEMS to measure CO₂ emissions according to the Tier 4 Calculation Methodology specified in § 98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

(b) For each soda ash manufacturing line that is not subject to the requirements in paragraph (a) of this section, calculate and report the process CO₂ emissions from the soda ash manufacturing line by using the procedure in either paragraphs (b)(1), (b)(2), or (b)(3) of this section; and the combustion CO₂ emissions using the procedure in paragraph (b)(4) of this section.

(1) Calculate and report under this subpart the combined process and combustion CO₂ emissions by operating and maintaining a CEMS to measure CO₂ emissions according to the Tier 4 Calculation Methodology specified in § 98.33(a)(4) and all associated requirements for Tier 4 in subpart C of this part (General Stationary Fuel Combustion Sources).

(2) Use either Equation CC-1 or Equation CC-2 of this section to calculate annual CO₂ process emissions from each manufacturing line that calcines trona to produce soda ash:

$$E_k = \sum_{n=1}^{12} \left[(IC_T)_n * (T_t)_n \right] * \frac{2000}{2205} * \frac{0.097}{1} \quad (\text{Eq. CC-1})$$

$$E_k = \sum_{n=1}^{12} \left[(IC_{sa})_n * (T_{sa})_n \right] * \frac{2000}{2205} * \frac{0.138}{1} \quad (\text{Eq. CC-2})$$

Where:

E_k = Annual CO₂ process emissions from each manufacturing line, k (metric tons).

$(IC_T)_n$ = Inorganic carbon content (percent by weight, expressed as a decimal fraction) in

trona input, from the carbon analysis results for month n. This represents the ratio of trona to trona ore.

$(IC_{sa})_n$ = Inorganic carbon content (percent by weight, expressed as a decimal fraction)

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in soda ash output, from the carbon analysis results for month n. This represents the purity of the soda ash produced.

$(T_i)_n$ = Mass of trona input in month n (tons).

$(T_{sa})_n$ = Mass of soda ash output in month n (tons).

2000/2205 = Conversion factor to convert tons to metric tons.

0.097/1 = Ratio of ton of CO₂ emitted for each ton of trona.

0.138/1 = Ratio of ton of CO₂ emitted for each ton of soda ash produced.

(3) *Site-specific emission factor method.* Use Equations CC-3, CC-4, and CC-5 of this section to determine annual CO₂ process emissions from manufacturing lines that use the liquid alkaline feed-stock process to produce soda ash. You

must conduct an annual performance test and measure CO₂ emissions and flow rates at all process vents from the mine water stripper/evaporator for each manufacturing line and calculate CO₂ emissions as described in paragraphs (b)(3)(i) through (b)(3)(iv) of this section.

(i) During the performance test, you must measure the process vent flow from each process vent during the test and calculate the average rate for the test period in metric tons per hour.

(ii) Using the test data, you must calculate the hourly CO₂ emission rate using Equation CC-3 of this section:

$$ER_{CO_2} = \left[(C_{CO_2} * 10000) * 2.59 \times 10^{-9} * 44 \right] * (Q * 60) * 4.53 \times 10^{-4} \quad (\text{Eq. CC-3})$$

Where:

ER_{CO_2} = CO₂ mass emission rate (metric tons/hour).

C_{CO_2} = Hourly CO₂ concentration (percent CO₂) as determined by § 98.294(c).

10000 = Parts per million per percent

2.59×10^{-9} = Conversion factor (pounds-mole/dscf/ppm).

44 = Pounds per pound-mole of carbon dioxide.

Q = Stack gas volumetric flow rate per minute (dscfm).

60 = Minutes per hour

4.53×10^{-4} = Conversion factor (metric tons/pound)

(iii) Using the test data, you must calculate a CO₂ emission factor for the process using Equation CC-4 of this section:

$$EF_{CO_2} = \frac{ER_{CO_2}}{(V_i * 4.53 \times 10^{-4})} \quad (\text{Eq. CC-4})$$

Where:

EF_{CO_2} = CO₂ emission factor (metric tons CO₂/metric ton of process vent flow from mine water stripper/evaporator).

ER_{CO_2} = CO₂ mass emission rate (metric tons/hour).

V_i = Process vent flow rate from mine water stripper/evaporator during annual performance test (pounds/hour).

4.53×10^{-4} = Conversion factor (metric tons/pound)

(iv) You must calculate annual CO₂ process emissions from each manufacturing line using Equation CC-5 of this section:

$$E_k = EF_{CO_2} * (V_a * 0.453) * H \quad (\text{Eq. CC-5})$$

Where:

E_k = Annual CO₂ process emissions for each manufacturing line, k (metric tons).

EF_{CO_2} = CO₂ emission factor (metric tons CO₂/metric ton of process vent flow from mine water stripper/evaporator).

V_a = Annual process vent flow rate from mine water stripper/evaporator (thousand pounds/hour).

H = Annual operating hours for the each manufacturing line.

0.453 = Conversion factor (metric tons/thousand pounds).

(4) Calculate and report under subpart C of this part (General Stationary Fuel Combustion Sources) the combustion CO₂, CH₄, and N₂O emissions in the soda ash manufacturing line according

to the applicable requirements in subpart C.

§ 98.294 Monitoring and QA/QC requirements.

Section 98.293 provides three different procedures for emission calculations. The appropriate paragraphs (a) through (c) of this section should be used for the procedure chosen.

(a) If you determine your emissions using § 98.293(b)(2) (Equation CC-1 of this subpart) you must:

(1) Determine the monthly inorganic carbon content of the trona from a weekly composite analysis for each soda ash manufacturing line, using a modified version of ASTM E359-00 (Reapproved 2005)e1, Standard Test Methods for Analysis of Soda Ash (Sodium Carbonate) (incorporated by reference, see § 98.7). ASTM E359-00(Reapproved 2005) e1 is designed to measure the total alkalinity in soda ash not in trona. The modified method referred to above adjusts the regular ASTM method to express the results in terms of trona. Although ASTM E359-00 (Reapproved 2005) e1 uses manual titration, suitable autotitrators may also be used for this determination.

(2) Measure the mass of trona input produced by each soda ash manufacturing line on a monthly basis using belt scales or methods used for accounting purposes.

(3) Document the procedures used to ensure the accuracy of the monthly measurements of trona consumed.

(b) If you calculate CO₂ process emissions based on soda ash production (§ 98.293(b)(2) Equation CC-2 of this subpart), you must:

(1) Determine the inorganic carbon content of the soda ash (i.e., soda ash purity) using ASTM E359-00 (Reapproved 2005) e1 Standard Test Methods for Analysis of Soda Ash (Sodium Carbonate) (incorporated by reference, see § 98.7). Although ASTM E359-00 (Reapproved 2005) e1 uses manual titration, suitable autotitrators may also be used for this determination.

(2) Measure the mass of soda ash produced by each soda ash manufacturing line on a monthly basis using belt scales, by weighing the soda ash at the truck or rail loadout points of your fa-

cility, or methods used for accounting purposes.

(3) Document the procedures used to ensure the accuracy of the monthly measurements of soda ash produced.

(c) If you calculate CO₂ emissions using the site-specific emission factor method in § 98.293(b)(3), you must:

(1) Conduct an annual performance test that is based on representative performance (i.e., performance based on normal operating conditions) of the affected process.

(2) Sample the stack gas and conduct three emissions test runs of 1 hour each.

(3) Conduct the stack test using EPA Method 3A at 40 CFR part 60, appendix A-2 to measure the CO₂ concentration, Method 2, 2A, 2C, 2D, or 2F at 40 CFR part 60, appendix A-1 or Method 26 at 40 CFR part 60, appendix A-2 to determine the stack gas volumetric flow rate. All QA/QC procedures specified in the reference test methods and any associated performance specifications apply. For each test, the facility must prepare an emission factor determination report that must include the items in paragraphs (c)(3)(i) through (c)(3)(iii) of this section.

(i) Analysis of samples, determination of emissions, and raw data.

(ii) All information and data used to derive the emissions factor(s).

(iii) You must determine the average process vent flow rate from the mine water stripper/evaporator during each test and document how it was determined.

(4) You must also determine the annual vent flow rate from the mine water stripper/evaporator from monthly information using the same plant instruments or procedures used for accounting purposes (i.e., volumetric flow meter).

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§ 98.295 Procedures for estimating missing data.

For the emission calculation methodologies in § 98.293(b)(2) and (b)(3), a complete record of all measured parameters used in the GHG emissions calculations is required (e.g., inorganic carbon content values, etc.). Therefore, whenever a quality-assured value of a